



IN THE U.S. PATENT AND TRADEMARK OFFICE

APPLICANT : SAIKATSU, Iwao et al.

SERIAL NO.: 10/042,153

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FOR: Non-Asbestos Friction Materials

GROUP: 1714

EXAMINER: WYROZEBSKI LEE, KATARZYNA

D E C L A R A T I O N

Honorable Commissioner of Patents and Trademarks Washington, D.C.

20231

Sir,

I, Iwao SAIKATSU, resident of Tatebayashi Plant, Nissinbo Industries, Inc., 1503, Akahori, Oura-machi, Oura-gun, Gunma-ken, Japan do hereby declare that:

1. I was graduated from Department of Technology of Tokyo University of Agriculture & Technology of Japan in March, 1982. Since April, 1982, I have been employed by Nissinbo Industries, the assignee of the above-identified application. I have been engaged in research and development relating to raw material for friction material in the laboratory of the Company.

2. I am the named inventor of the above-identified

application and hence, am familiar with the subject matter disclosed in said application.

3. In order to show the feature of the present invention, I conducted the following experiments.

[Experiment]

Comparative Examples 4 and 5

Comparative Examples 4 and 5 were prepared and tested in accordance with Examples of the present specification, which is described as follows.

The friction material composition in Comparative Examples was formulated as shown in Table 1, then uniformly blended in a Loedige mixer and preformed in a pressure mold under a pressure of 100 kg/cm³ for 10 minutes. The preform was molded for the desired length of time at a temperature of 160°C and a pressure of 250 kg/cm², and post-cured by 5 hours of heat treatment at 200°C, yielding a brake lining for drum brakes.

The brake linings obtained in Comparative Examples 4 and 5 were subjected to coefficient of friction measurements and to squeaking and noise tests and wear tests by the methods described below. The results are presented in Table I.

Coefficient of Friction:

Measured in accordance with JASO C406.

Squeaking and Noise Generation Tests (in accordance with JASO C402)

The frequency of squeaking and the frequency of noise generation during braking were determined in a road vehicle test and rated as follows.

Very Good: incidence 1% or less

Good: incidence 3% or less

Fair: incidence less than 10%

Poor: incidence 10% or more

Wear Test (according to JASO C406)

Test conditions were initial braking speed, 50 km/h; braking deceleration, 0.15 g; number of braking applications, 1,000 times;

brake temperature before braking, 150° C. The amount of wear on the mating surface of the drum was rated as follows.

- Very Good: slight wear (less than 100 µm)
- Good: modest wear (100 to 200 µm)
- Fair: substantial wear (200 to 300 µm)
- Poor: very substantial wear (more than 300 µm)

Table I

	Comparative Example	
	4	5
Aramid fibers	10	10
Potassium titanate fibers	3	3
Glass fibers	-	-
Rock wool	-	-
Phenolic resin	15	15
Cashew dust	13	15
Other organic fillers	15	15
Inorganic fillers	44	42
Total (vol %)	100	100
Friction coefficient	0.40	0.40
Wear	very good	very good
Squeaking, Noise	fair	poor

In Table I, the amount of each component is given in volume percent based on the overall composition. Individual items in the tables are described in further detail below.

Inorganic Fibers

Potassium titanate fibers: Mohs hardness, 4; length, 150 µm; diameter, 30 µm

Glass fibers: Mohs hardness, 6; length, 3,000 µm; diameter, 10 µm

Rock wool: Mohs hardness, 6; length, 250 µm; diameter, 5 µm

Other Organic Fillers

Ground tire rubber and rubber powder in a 1:1 volumetric ratio

Inorganic Fillers

Slaked lime, 3 vol %; with the balance being calcium carbonate

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Dated this 8th day of January, 2004

A handwritten signature in black ink, appearing to read "Dwaipayan Saha". The signature is fluid and cursive, with a large, stylized "D" at the beginning. It is enclosed within a simple, rounded rectangular border.